

Environmental Protection Agency

California Inspection and Maintenance Test Procedure

This procedure is written for the Environmental Protection Agency, National Vehicle and Fuel Emissions Laboratory (NVFEL) internal use. The use of specific brand names by NVFEL in this procedure are for reference only and are not an endorsement of those products. This document may be used for guidance by other laboratories.

NVFEL Reference Number

715B

Implementation Approval

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Revision Description

- (1) 09-30-94 The purpose of this change is to revise the procedure as described in EPCN #170.

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1. Purpose

The purpose of this procedure is to demonstrate compliance with the California Inspection and Maintenance (I/M) Standard by measuring vehicle exhaust carbon monoxide (CO) and hydrocarbon (HC) concentrations at idle and at 2500 rpm.

2. Test Article Description

1993 and subsequent model year California and 50 state light-duty vehicles scheduled for certification testing

3. References

- 3.1 California Exhaust Emission Standards and Test Procedures for 1988 and Subsequent Model Passenger Cars, Light-Duty Trucks, and Medium-duty Vehicles, adopted May 20, 1987; amended January 22, 1990
- 3.2 "Code of Federal Regulations," Title 40, Part 86
- 3.3 California Emissions Test Analyzer Operations Guide: Allen P/N 25397
- 3.4 Engineering Operations Division (EOD) Test Procedures Manual: TP 703, TP 707 and TP 710

Note: All references to the EOD Test Procedures Manual include the procedures referenced and all subsequent revisions thereof.

4. Required Equipment

- 4.1 Forms
 - 4.1.1 VT Label, Prep Ambient Temperature (see Attachment A)
 - 4.1.2 Form 801-01, Data Location

4.2 Video Driver's Aid System:

4.2.1 Microcomputer

Equipment used: Macintosh Plus, Model #M0001A, with Relax Technology 45 Megabyte Hard Disk Drive, Model #C46668

4.2.2 Video Monitor

Equipment used: Electrohome Electronics Model #38-V19NWB-AP

4.2.3 Data Acquisition Device

Equipment used: Taurus Model IDAC 2000

4.2.4 Mass Storage Device

Equipment used: Fujitsu 185 MB Hard Drive

4.2.5 Printers

Equipment used: Apple LaserWriter

4.2.6 File Server Software

Equipment used: Apple Computer's Appleshare

4.3 Chassis dynamometer, with a power absorption unit to simulate the road load power and flywheels to simulate the vehicle's equivalent test weight.

Equipment used: Clayton ECE-50

4.4. Dynamometer roll revolution counter

Equipment used: KLT-Custom fabricated to EOD specifications

4.5 Vehicle Restraint System:

- 4.5.1 Cable winch, permanently affixed to the test cell floor, to restrain the test vehicle horizontally on the dynamometer to minimize rocking in rolls.

Equipment used: Little Mule Products Model #B2 Puller Hoist

- 4.5.2 Cable winches, permanently affixed to the test cell floor, or anchor hooks attached to the dynamometer frame and tie-down straps, to restrain front-wheel drive vehicles on the dynamometer.

Equipment used: Little Mule Products Model #B2 Puller Hoist Eastern Rotorcraft Corp. Tie-Down Part #SP-4212-1

- 4.5.3 Wheel chock

Equipment used: Clayton

4.6 Bureau of Automotive Repair (BAR) Test Analyzer System (TAS) or equivalent emission analyzer.

Equipment used: Allen BAR 90 (Model # 53-180)

4.7 Allen BAR Analyzer probe with 3-way control valve (two required for dual exhaust).

4.8 Exhaust Connecting Pipes:

- 4.8.1 Flexible exhaust tubes

- 4.8.2 Exhaust tube adapters

- 4.8.3 Exhaust tube clamp(s)

- 4.8.4 Exhaust tube gaskets and boot assemblies

- 4.8.5 California I/M exhaust adapter (see Attachment E)

4.9 Exhaust Gas Sampling System:

4.9.1 Critical Flow Venturi-Constant Volume Sampler (CFV-CVS)

Equipment used: Philco Ford Model #CVS-20 (D001-D005)

4.9.2 CVS Compressor Unit (Blower)

Equipment used: Spencer Turbine Co. Model #2007-H Turbo Compressor (D001-D005)

4.10 Compressed air supply with air hose, tire inflation chuck, and calibrated pressure gauge.

4.11 Fixed speed cooling fan with a capacity not exceeding 5,300 cubic feet per minute (cfm).

This fan is to be used only during the 505 dynamometer driving schedule (if the 505 driving schedule is required).

Equipment used: Hartzell Fan Model #N24-DUWS

4.12 Lab Computer System (LCS) interface unit and Test Analysis Processor (TAP).

Equipment used: Datasouth Computer Corporation Model #DS120 Terminal (a converted Digital Equipment Corp. Decwriter II Terminal Model #LA36DK) with pressure-sensitive 3-part paper and ribbons stored in its vicinity, and the analyzer/LCS interface panel located on the analyzer control module

4.13 Test cell ambient monitoring system:

4.13.1 Type "J" thermocouple and temperature/millivolt transmitter (D001-D006), or thermocouple thermometer connected to a strip chart recorder (D001-D006) or Test Analysis Program (TAP) computer (D001-D006)

Equipment used: Leeds and Northrop Temperature/Millivolt Transmitter Model #Centry 479
Omega Engineering Thermocouple Thermometer Model #199
Strip Chart Recorder: Soltec Model #33112-2 or #3316-6
Hewlett-Packard Strip Chart Recorder Model #7132A
LCS-TAP

4.13.2 Dew-Point Hygrometer located in the test cell, interfaced with LCS

Equipment used: General Eastern 1200 APS

4.13.3 Digital Barometer, centrally located, interfaced with LCS

Equipment used: Bell and Howell Digital Barometer

5. Precautions

5.1 The driver must not use the test vehicle brakes and accelerator simultaneously; therefore, brakes and accelerator must be operated using the same foot.

5.2 The vehicle restraint system that secures the test vehicle on the dynamometer must be adjusted to allow approximately 2 inches of play at the center of the cable or strap.

Do not overtighten.

5.3 When the test vehicle is connected to the Constant Volume Sampler (CVS) sample collection unit, care must be taken to avoid putting excessive strain on the vehicle's exhaust system.

The CVS blower must be operating when the vehicle's engine is running.

5.4 The floor exhaust scrubber system must be on.

Check for flow and notify the Building Service Contractor if necessary.

5.5 If vehicle starting procedures are not with the vehicle, contact the appropriate supervisory personnel.

5.6 The test cell door(s) should be closed before any vehicle is operated on a dynamometer.

5.7 The driver must remain inside the vehicle in the proper driving position at all times while it is being operated on the dynamometer.

5.8 The test vehicle must be correctly aligned on the dynamometer prior to testing.

- 5.9 The BAR 90 Analyzer power cord should be plugged into 110 VAC and the main power switch (mounted on the lower right rear panel of the analyzer) turned on all the time.

The TAS has an internal oven to stabilize the temperature of the computer electronics, and unplugging or turning off the analyzer disables this internal oven.

The required time to warm up the oven (stabilize the computer circuitry) is 15 minutes after plugging in and/or turning on the analyzer.

- 5.10 The power switch to the strip chart recorder should be left on all the time.

Note: When the strip chart recorder power has been off for a period of time, it has to be turned on and warmed up for an equal length of time.

The chart recorder is considered to be warmed up after being on for one hour.

If the recorder is turned on at this time, the time must be recorded on the strip chart.

6. Visual Inspection

- 6.1 Inspect the boots, gaskets, and connecting pipes for leaks and ensure that the CFV-CVS I/M port is capped.
- 6.2 Other visual inspections are included as part of test preparation or test procedures.

7. Test Article Preparation

California code requires all vehicles that are to be subjected to the California Inspection and Maintenance Test operate in the idle mode for a 10-minute minimum preconditioning period after the thermostat has been opened.

If the test vehicle has just completed a Federal Test Procedure (FTP), Highway Fuel Economy Test (HFET) and/or other dynamometer driving test or combination of tests such that the engine has been operating for more than eight minutes, it is considered warm, i.e., the thermostat is open.

This section explains the step-by-step procedure for preparing a vehicle which is not warmed up.

Many of the steps listed below will have been completed for a vehicle which has just finished a dynamometer test. Those steps should be omitted if that is the case.

- 7.1 Test cell ambient conditions:
 - 7.1.1 Ensure that the test cell air handling system is “ON.”
 - 7.1.2 Ensure that the dry bulb temperature is 72-78 °F.
 - 7.1.3 Ensure that the dew-point temperature is 45-50 °F.
 - 7.1.4 Ensure that the dew-point hygrometer flow is at 2.0 standard cubic feet per hour (scfh).
 - 7.1.5 Ensure that the mechanical adjustment of the strip chart recorder is set to zero.
- 7.2 Drive the test vehicle onto the dynamometer and center the drive wheels on the rolls. Shift the transmission into neutral and turn the engine off.

Ensure that the drive tires have adequate side clearance from the dynamometer frame.

If the vehicle fails to center properly, notify the appropriate supervisory personnel.
- 7.3 Mark the ambient strip chart to indicate when the vehicle entered the test cell.
- 7.4 Check and adjust the drive tire pressure to 45 psi unless otherwise specified.
- 7.5 Set the dynamometer inertia weight (equivalent test weight) and indicated horsepower to the values specified on the Vehicle Information sheet.
- 7.6 Release the roll brake.
- 7.7 Ensure that the front/rear roll switch is in the “REAR ROLL” position.
- 7.8 Connect the appropriate vehicle restraint system.

- 7.9 Connect the vehicle exhaust to the CVS unit, ensure that the CVS dump hose is inserted in the floor exhaust scrubber and is not crimped; then turn the CVS blower on.

Note: If the test vehicle has dual exhaust, it may be necessary to connect the second tailpipe to the CVS unit using the California I/M exhaust adapter in order to accommodate two BAR 90 sample probes.

Two probes and two 3-way valves are required.

Some dual exhaust vehicles are supplied with a “Y” pipe which allows for a single exhaust and single probe connection.

- 7.10 Open the hood or engine compartment cover.
- 7.11 Position the cooling fan(s) within 12 inches of the vehicle. Turn the cooling fan(s) on (see manufacture's instructions to determine if more than one fan is required).
- 7.12 Place the wheel chocks on the non-drive wheels.
- 7.13 Ensure that all accessory switches on the test vehicle are in the “OFF” position prior to starting the engine.
- 7.14 Ensure that the correct starting procedures are located in the vehicle.
- 7.15 Sign on to the Video Driver's Aid (VDA) System and select the appropriate test number with the “-CAL” suffix (0192-9999-CAL.).

See TP 703, Section 7, for the operation of the VDA.

- 7.16 Perform the first 505-second portion of the Urban Dynamometer Driving Schedule.

See TP 703, Section 8, for details.

Note: If the position of the thermostat is opened, step 7.16 does not have to be performed, and may be omitted. The engine still has to idle for 10 minutes or 600 seconds as indicated on the VDA.

- 7.17 At the conclusion of the fifth idle (at approximately 505 seconds into the driving sequence), perform the following steps:

- 7.17.1 Place the test vehicle shift control in the neutral position and let the engine idle.
 - 7.17.2 Turn off the Hartzell fan. The California Regulation does not allow artificial cooling during the 10-minute minimum idle preconditioning sequence and during the tail-pipe measuring sequence.
 - 7.17.3 Enter the start of the 10-minute minimum idle preconditioning on the VDA and allow the VDA to continue to run to monitor the idle time.

The required 10-minute minimum idle preconditioning time is complete when the VDA time of 1105 is reached (which includes the 505 second warm-up time).
 - 7.17.4 Move the VDA monitor so that the Allen BAR 90 Analyzer can be positioned near the vehicle. Proceed with the calibration/ leak-check sequence and the BAR 90 Analyzer vehicle data entry.
- 7.18 Allen BAR 90 Analyzer Calibration/Leak-Check Sequence

The symbols < > are used to indicate a key on the chart recorder keyboard.

Example: Push <Enter>. This means that you need to push the key labeled “Enter.”

- 7.18.1 Press <ENTER> to activate the screen. The main menu will appear.

Note: If pressing the enter key does not turn the screen on, ensure that the power cord is plugged in, the rear panel power switch is turned on, and the standby/power switch on the front panel is turned on.

If the power cord is not plugged in or the rear panel power switch is turned off, the warm-up time is 15 minutes.

- 7.18.2 Select “AUXILIARY FUNCTIONS” from the main menu by typing the number “7” and pressing <ENTER>.
- 7.18.3 When the Allen prompts “ENTER YOUR ACCESS CODE,” select the daily access code from the code calendar.

The code calendar is found in the Allen BAR 90 Analyzer Log Book, which is stored on the shelf next to the analyzer keyboard.

Type in the code for the current date and press <ENTER>.

- 7.18.4 The word “LOCKOUT” may appear in the upper right hand corner of the screen. One reason the “LOCKOUT” prompt appears is that the unit may have to be calibrated.

If so the message “CALIBRATE UNIT TO DISABLE LOCKOUT” will appear below the main menu.

The BAR 90 will be calibrated prior to every California I/M test.

- 7.18.5 Select “3-DAY CALIBRATION” from the auxiliary function menu by typing the number “1” and pressing <ENTER>.

The prompts “CHECKING FLOW” then “ZEROING BENCH” will appear momentarily on the screen.

- 7.18.6 When the Allen prompts “Adjust pressure on both bottles to 10 PSI,” rotate the calibration gas cylinder on/off valves counterclockwise to allow the flow of gas from the LO and MID calibration gas cylinders.

The indicated pressure on the calibration bottle gauge may be more than 10 pounds, but should not exceed 15 pounds.

Press <ENTER>.

At this time the following prompts should momentarily appear on the screen:

“Sampling Calibration Gas,” followed by “Calibrating.”

- 7.18.7 Rotate the 3-way valve of the Allen BAR 90 Analyzer probe to the fully clockwise position.

The arrow on the valve handle points away from the flexible exhaust tube.

This will allow ambient air to flow to the analyzer. The BAR 90 dual probe sample hose must be installed if it will be used to test a dual exhaust vehicle.

Some dual exhaust vehicles are supplied with a “Y” pipe which allows for a single exhaust and single probe connection.

- 7.18.8 When the Allen prompts “Turn Off Both Gas Bottles,” rotate the gas cylinder on/off valves that control the flow of gases from the two cylinders clockwise.

Press <ENTER> to proceed.

At this time the bench will rezero and the screen will momentarily display, “Checking Flow,” then “Zeroing Bench.”

- 7.18.9 The Allen will display “Checking Vacuum”; then, when it prompts “Cap End Of Exhaust Probe,” rotate the 3-way valve 90 degrees from the fully clockwise position (both valves when using dual probes) and press <ENTER>.

This will prevent air from entering the analyzer. At this time the screen will display the prompt “Checking Vacuum.”

- 7.18.10 Upon successful completion of the calibration/leak check test, the Allen will ask you if you want one or two copies of the Test Report.

Type in the number 2 to print two copies of the report and press <ENTER>.

Include one copy with the data packet and file the other copy in the Allen BAR 90 Analyzer Log Book.

If the calibration/leak check is unsuccessful, repeat the process.

If the analyzer fails the second attempt of the calibration/leak check test, notify the senior technician.

- 7.18.11 When the Allen prompts “Remove Cap From End of Exhaust Probe,” rotate the 3-way valve to the fully counterclockwise position.

This will allow exhaust gases to flow from the probe into the analyzer.

The arrow on the handle should point toward the flexible tube.

- 7.18.12 Return to the “Main Menu” by typing the number “0” and pressing <ENTER>.

- 7.18.13 Another “LOCKOUT” prompt may appear on the screen. Press <F6> to determine the reason.

The Allen BAR 90 analyzer is designed to send I/M test results to a California state computer via a telephone line.

The analyzer is programmed to detect a dial tone.

If the dial tone is not present for 5 days, the “LOCKOUT” prompt will appear and the analyzer will not perform the I/M test.

- 7.18.14 If the “LOCKOUT” prompt is caused by the “NO DIAL TONE DETECT” prompt, it can be overcome by performing the following steps.

If the “NO DIAL TONE DETECT” prompt does not appear, proceed to Step 7.19.

- 7.18.15 Select “QA/STATE FUNCTIONS” from the “AUXILIARY FUNCTIONS” menu by typing the number “10” and pressing <ENTER>.

- 7.18.16 Select “LOCKOUT T.A.S.” from the “QA STATE FUNCTIONS” menu by typing the number “7” and pressing <ENTER>.

- 7.18.17 Select “CLEAR DIAL TONE DETECT” by typing the number “2” and pressing <ENTER>.

The screen will go blank.

- 7.18.18 Return to the “MAIN MENU” by pressing <ESC> (the ESC key is on the upper left hand corner of the keyboard).

7.19 Allen BAR 90 Analyzer Vehicle Data Entry

Note: The vehicle entry data prompts were instituted to provide information to the State of California about California-registered vehicles being tested.

Since the EPA has this data on other data sheets, some entries were standardized.

- 7.19.1 Select the “Smog Check Menu” from the main menu by typing the number “1” and pressing <ENTER>.
- 7.19.2 Select “Smog Check” from the Smog Check Menu by typing the number “1” and pressing <ENTER>.
- 7.19.3 When the Allen prompts “Enter Access Code,” type in the number 12345 and press <ENTER>.
- 7.19.4 When the Allen prompts “Do you wish to use a previous vehicle's data,” move the cursor to the “N” position and press <ENTER>.
- 7.19.5 When the Allen prompts for the “Model Year,” type in the last 2 digits of the model year for the test vehicle and press <ENTER>.
- 7.19.6 When the Allen prompts “California License Plate Number,” type in the 6-digit FTP test number and press <ENTER>.
- 7.19.7 When the Allen prompts for “VEHICLE IDENTIFICATION NUMBER” (VIN), type in 17 ones (11111111111111111) and press <ENTER>.
- 7.19.8 When the Allen prompts “ENTER VEHICLE TYPE,” move the cursor to the “P” position and press <ENTER>.
- 7.19.9 When the Allen prompts for “Manufacturer,” move the cursor to highlight the test vehicle manufacturer's name and press <ENTER>.

If the manufacturer's name is not listed press <F6>, type in the manufacturer's name, and press <ENTER>.

- 7.19.10 When the Allen prompts for each of the following: “Number of Cylinders,” “Engine size,” and “measurement type” (liters, cubic inches or cubic centimeters), type in the data from the Vehicle Specification Report and press <ENTER>.
- 7.19.11 When the Allen prompts for the “Transmission Type,” type in the letter “A” or “M” which describes the transmission type and press <ENTER>.
- 7.19.12 When the Allen prompts for “Odometer reading,” type in the test vehicle's odometer reading and press <ENTER>.
- 7.19.13 When the Allen prompts for “Enter California Certificate Code,” type in the letter “C,” for California certification, then press <ENTER>.
- 7.19.14 When the Allen prompts for the type of inspection, “Initial Inspection” or “After Repairs Test,” move the cursor to “INITIAL INSPECTION” and press <ENTER>.
- 7.19.15 When the Allen prompts “Why is the Vehicle Being Tested,” move the cursor to 1 (for biennial inspection) and press <ENTER>.
- 7.19.16 When the Allen prompts for the fuel type, move the cursor to “UNLEADED” and press <ENTER>.
- 7.19.17 When the Allen prompts for the type of exhaust, move the cursor to the “N” position and press <ENTER>.
- 7.19.18 When the Allen prompts for a visual inspection of various components of the emission control system, type in the letter “P” and press <ENTER> for each component.
- 7.19.19 When the Allen prompts for the type of fuel system, move the cursor to the “FUEL INJECTION” position and press <ENTER>.
- 7.19.20 When the Allen prompts about the use of air injection, move the cursor to the “NO” position and press <ENTER>.

- 7.19.21 When the Allen prompts for a visual inspection of more components of the emission control system, type in the letter “P” and press <ENTER> for each component.
- 7.19.22 The Allen will now display the data entered in two screens.
- Review the first screen of data and if it is correct, press <F10>.
- 7.19.23 The Allen will now display the rest of the data entered; if it is correct press <F10>.
- At the conclusion of the data review, the BAR 90 will automatically return to the main menu.
- 7.20 Insert the probe into the exhaust flow stream via the I/M exhaust port, which is part of the CFV-CVS system.
- Caution: care should be observed because the exhaust pipe(s) may be hot.
- If the vehicle has a dual exhaust, it may be necessary to connect a second probe between the test vehicle and the analyzer.
- The adapter described in Attachment E is used with a dual exhaust system.
- A second 3-way valve and probe is required.
- 7.21 The rpm signal will be observed by connecting the Allen tach lead to any spark plug lead of the engine.
- Ensure that the proper ignition type is selected on the Allen.
- If the ignition type is incorrect, access the “AUXILIARY FUNCTIONS” menu and select the appropriate ignition type.

8. Test Procedure

- 101 Select “SMOG CHECK MENU” from the main menu by typing the number “1” and pressing <ENTER>.
- 102 Select “SMOG CHECK” from the smog check menu by typing the number “1” and pressing <ENTER>.
- 103 Check the VDA system to determine if the 10-minute minimum idle preconditioning sequence has been completed, i.e., the observed time is greater than 1105 seconds (following a 505-second drive).
- 104 When the minimum idle time is reached and all is ready to proceed with the BAR 90 exhaust measurements, ensure that the transmission remains in neutral and that the Hartzell cooling fan remains turned off.

Note: A remote control key is available if the Allen TAS cannot be positioned near the test vehicle. It functions the same as the keyboard.

- 105 Press <ENTER> on the BAR 90 Analyzer to initiate the test. Use the VDA event marker to indicate the start of the California I/M test.

If at any time the vehicle becomes unsafe to operate (e.g., oil pressure light on, etc.), immediately shut off the engine and abort the test by pressing <ESC>.

- 106 Increase and stabilize the engine rpm between 2250 and 2750 (2500 rpm is the target speed). The Allen BAR 90 Analyzer will automatically initiate the mode timer when the engine rpm enters the range.

The mode timer will count down from 30 seconds. Any deviance from the rpm range will automatically reset the mode timer.

When the mode timer reaches 5 seconds, the BAR 90 will automatically begin recording the exhaust concentrations.

The measurement is concluded when the mode timer completes the countdown to 0 seconds.

- 107 Allow the engine rpm to return to idle.

When the engine rpm enters the idle range (400-1200 rpm), the mode timer will automatically reset and begin a new countdown from 30 seconds.

Again, when the mode timer reaches 5 seconds the TAS will automatically begin recording the exhaust concentrations.

The measurement is concluded when the mode timer completes the countdown to 0 seconds.

- 108 At the conclusion of this measurement period, the Allen will indicate on the screen whether the vehicle passed or failed the test.

If the vehicle has passed the test, continue with Step 109; if the vehicle has failed the test, proceed to Step 118.

- 109 Shut the engine off, remove the BAR 90 Analyzer test probe from the exhaust piping, and remove the tach lead from the engine.

- 110 When the Allen prompts for a "Fuel Fillerpipe Lead Restrictor" inspection, type in the letter "P" for pass and press <ENTER>.

- 111 When the Allen prompts for an "Exhaust Gas Recycling" system inspection, type in the letter "P" and press <ENTER>.

- 112 When the Allen prompts for the "Ignition Timing Setting," type in the value indicated on the Vehicle Specification Report and press <ENTER>.

- 113 When the Allen prompts "BTDC" or "ATDC," type in the proper response as indicated on the Vehicle Specification Report, and press <ENTER>.

- 114 When the Allen prompts for the functionality of the "Emission Control Check Engine Light" or the "System Malfunction Light/Indicator," type in the letter "P" and press <ENTER>.

- 115 When the Allen prompts for the functionality of the “Emission Control Main Light,” type in the letter “P” and press <ENTER>.
- 116 When the Allen prompts “Were Any Repairs Made to the Emission Control System?” type in the letter “N” for none and press <ENTER>.
- 117 When the Allen prompts for the number of Smog Check Inspection Reports to be printed, type in “1” and press <ENTER>.
- 118 If the test vehicle has failed the California Air Resources Board requirements, the TAS will display instructions for repeating the exhaust measurements.

Increase the engine speed to 2500 \pm 300 rpm for 3 minutes, then repeat Steps 106- 116.

If the test vehicle still fails the test as indicated on the Smog Check Inspection Report, proceed to Step 120 and notify the Certification Representative.

If it passes, proceed to Step 119.

- 119 Review the Smog Check Inspection Report to determine if the HC and CO concentrations exceed the limits shown below.

The pass/fail criteria are different than those programmed into the BAR 90 and must be checked manually.

If the limits are exceeded, check the equipment to verify that the measurement is valid and then notify the Certification Division Representative that the vehicle exceeded 85% of the limit/s.

Exhaust Concentration Limits

<u>rpm</u>	<u>HC (ppm)</u>	<u>CO (%)</u>
2500	187	1.02
IDLE	85	0.85

- 120 Record the values for HC, CO, and rpm for each mode of the two-speed idle test in the Comments section of Form 708-01, in the following format:

CAL I/M TEST: IDLE- XXX RPM, HC- XXX ppm, CO- X.X%,
2500 RPM- XXXX RPM, HC- XXX ppm, CO- X.X%, MM-DD-YY.

- 121 Mark the ambient strip chart to indicate the end of the test, remove the recorded information from the strip chart recorder, and complete the Prep Ambient Temperature label.

Write "CAL I/M TEST" next to the test number in the test number blank.

- 122 Disconnect the test vehicle from the dynamometer vehicle restraint system, disconnect the vehicle exhaust system from the CVS or floor exhaust dump, engage the dynamometer roll brake, and drive the vehicle at minimum necessary throttle into the soak area.

- 123 If either exhaust concentration (HC or CO) exceeds the amount listed in Step 119 the vehicle has to be tested once using a Commercial Grade Fuel.

Inform the Certification Division Representative about the special type of failure and inform the Test Scheduler that the vehicle has to be tested.

The complete TP 715 must be repeated, except that the vehicle warm up (step 7.16) will consist of a complete LA-4 drive instead of just a 505-second drive.

- 124 When signing on to the VDA system for this test, the CAL suffix (step 7.15) will have a 2 added to the CAL (0192-9999-CAL2).

The strip chart sticker will be labeled CAL I/M TEST2 next to the test number in the test number blank (ref. step 121).

9. Data Input

- 9.1 BAR 90 Analyzer HC, CO, CO₂, and O₂ calibration gas readings are automatically recorded by the BAR 90 computer.

- 9.2 The ambient temperature and humidity are recorded on the ambient monitoring system strip chart.

- 9.3 The engine idle preparation time is recorded on the VDA.
- 9.4 The tail-pipe HC and CO concentrations and engine rpm are automatically recorded by the BAR 90 computer.

10. Data Analysis

- 10.1. A verifying technician reviews the “LEAK/CALIBRATION TEST” report, “Smog Check Inspection Report,” the ambient strip chart trace, and VDA summary report to verify that the test date, test times, test number, vehicle ID, and the dynamometer site were entered correctly.
- 10.2. The verifying technician ensures that the acceptance criteria in Section 12 are met.
- 10.3. The verifying technician ensures that the values in the Comments section of Form 708-01 were accurately transcribed from the “Smog Check Inspection Report.”

11. Data Output

- 11.1 One copy of the BAR 90 Computer Report “LEAK/CALIBRATION TEST” is filed in the test packet, and one copy is filed in the Allen BAR 90 Calibration Logbook which is kept with the analyzer.
- 11.2 The BAR 90 Computer Report, “Smog Check Inspection Report,” is filed in the test packet.
- 11.3 The California I/M Test Ambient Monitoring System strip chart trace is filed in the test packet.
- 11.4. The VDA report, showing the 10-minute minimum idle preconditioning test time, is filed in the test packet.

12. Acceptance Criteria

The following criteria must be met for the test to be valid:

- 12.1 The Ambient Temperature must be in the 68-86 °F range during the 10-minute idle prep and tailpipe exhaust test.
- 12.2 The vehicle idle preconditioning time must be greater than 10 minutes.
- 12.3 The vehicle engine must be warm, i.e., the thermostat open, prior to the start of the 10-minute minimum idle preconditioning preparation.
- 12.4 The BAR 90 analyzer must be calibrated within one hour of the tailpipe exhaust test.
- 12.5 The Certification Division representative is notified when a test result exceeds 85% of the California standard.

See section 8, Step 109 for numerical limits.

- 12.6 The verifying technician must indicate the date of the verification and record his EPA ID number on each document reviewed.

13. Quality Provisions

- 13.1 The technician's identification number must appear on all forms and test records, certifying that the data are accurate and complete.
- 13.2 The BAR 90 analyzer is calibrated and leak checked prior to every test.
- 13.3 All reports and test records are verified by a qualified technician (verifying technician) who did not perform the test.
- 13.4 The ambient humidity is controlled.

Attachment A

Prep Ambient Temperature

Date: _____ Dyno #: D00 _____

Test #: _____

Vehicle ID #: _____

Manufacturer: _____

ET #: _____ Chart Speed _____ cm /hr

Tech ID #: _____

Ver. ID #: _____ Date: _____

Attachment B
SMOG CHECK INSPECTION REPORT
STATE of CALIFORNIA

SMOG CHECK IS MAKING A DIFFERENCE AND YOU ARE HELPING. EMISSIONS HAVE BEEN REDUCED BY MORE THAN 50 PERCENT ON VEHICLES FAILING A SMOG CHECK INSPECTION. KEEP YOUR VEHICLE TUNED-UP AND IN GOOD RUNNING CONDITION BETWEEN SMOG CHECKS AND USE PUBLIC TRANSIT WHENEVER YOU CAN. WORKING TOGETHER, WE CAN CONTINUE TO IMPROVE OUR AIR QUALITY.

OVERALL TEST RESULTS - - **ABORT**

TEST TYPE

INITIAL INSPECTION

SMOG CHECK INSPECTION ABORTED BECAUSE OF:

99 OTHER _____

BY STATE LAW, THE MANUFACTURER OF YOUR VEHICLE IS REQUIRED TO PERFORM NO-COST EMISSION WARRANTY REPAIRS ON YOUR VEHICLE IF IT FAILS A SMOG CHECK INSPECTION FOR A PERIOD OF 3 YEARS OR 50,000 MILES, WHICH EVER COMES FIRST. ALSO, CHECK YOUR OWNER'S MANUAL TO DETERMINE THE COVERAGE PROVIDED UNDER THE FEDERAL EMISSIONS 5 YEAR/50,000 MILE WARRANTY. TAKE YOUR VEHICLE TO AN AUTHORIZED DEALER SERVICE CENTER TO OBTAIN FREE EMISSION DIAGNOSIS AND REPAIRS. IF YOU NEED ASSISTANCE OR MORE INFORMATION, CONTACT THE AIR RESOURCES BOARD AT 1-800-242-4450.

BY STATE LAW, THE MANUFACTURER OF YOUR VEHICLE IS REQUIRED TO WARRANT EMISSION RELATED PARTS WHICH, AT THE TIME OF CERTIFICATION BY THE STATE BOARD, ARE ESTIMATED BY THE MANUFACTURER TO COST INDIVIDUALLY MORE THAN \$300 TO REPLACE (PARTS AND LABOR), FOR A PERIOD OF SEVEN YEARS OR 70,000 MILES, WHICHEVER FIRST OCCURS.

VISUAL INSPECTION INFORMATION

PCV SYSTEM	PASS
THERMOSTATIC AIR CLEANER	PASS
FUEL EVAPORATIVE CONTROLS	PASS
CATALYST	PASS
EXHAUST GAS RECIRCULATION	PASS
IGNITION SPARK CONTROLS	PASS
CARBURETOR	PASS
O2 SENSOR AND CONNECTIONS	PASS
WIRING OF OTHER SENSORS/SWITCHES/COMPUTER	PASS
VACUUM LINE CONNECTIONS TO SENSORS/SWITCHES	PASS
OTHER EMISSIONS RELATED COMPONENTS	PASS

FUNCTIONAL INSPECTION INFORMATION

NO INFORMATION AVAILABLE DUE TO ABORTED TEST

Attachment B Continued

EMISSIONS TEST RESULTS		2500RPM
	MAXIMUM ALLOWABLE EMISSIONS	
MEASURED		RESULTS
HYDROCARBONS (PPM)	38	220
CARBON MONOXIDE %	0.23	1.20
CARBON DIOXIDE %	11.0	
OXYGEN %	5.3	
2500 RPM	2568	

EMISSIONS TEST RESULTS				IDLE
	MAXIMUM ALLOWABLE EMISSIONS	AMOUNT OVER LIMIT		
MEASURED				RESULTS
HYDROCARBONS (PPM)	633	100	533	FAIL
CARBON MONOXIDE %	0.11	1.00		PASS
CARBON DIOXIDE %	5.6			
OXYGEN %	12.3			
IDLE RPM	854			

VEHICLE INFORMATION

MODEL YEAR:	92
LICENSE PLATE NUMBER:	92XXX
VEHICLE IDENTIFICATION NUMBER:	XXXXXXXXXXVOO
VEHICLE CLASSIFICATION:	PASSENGER CAR
MANUFACTURER:	CHEVROLET
NUMBER OF CYLINDERS:	6
ENGINE SIZE:	3.0 LITERS
TRANSMISSION:	AUTOMATIC
ODOMETER READING:	45600
CERTIFICATION STATUS:	CALIFORNIA CERTIFIED
FUEL TYPE:	GASOLINE
DUAL EXHAUST:	NO
INSPECTION REASON:	BIENNIAL INSPECTION

TEST DATE: 04/03/92

TEST TIME: 15:05

Station Number: RA111111

MECHANIC ID: EU123456

The Vehicle described above has been inspected in accordance with all bureau requirements and the information listed on this vehicle inspection report is true and correct.

Mechanic's signature _____

RETAIN THIS COPY FOR USE ON RETEST

US EPA NVFEL EOD TPB VT
2565 PLYMOUTH RD.
ANN ARBOR MI 48105

Attachment C

LEAK/CALIBRATION TEST

Station Number	RA111111
Analyzer Number	AT006906
Date	04/03/92
Time	01:45 PM PST

P.E.F. Number	.518
HC span gas	: 300 PPM
HC zero reading	: -3 PPM
HC span reading	: 161 PPM
CO span gas	: 1.00%
CO zero reading	: 0.00%
CO span reading	: 1.00%
CO span gas	: 6.0 %
CO2 zero reading	: 0.0%
CO2 span reading	: 6.1%
O2 span gas	: 20.8%
O2 zero reading	: 0.1%
O2 span reading	: 20.8%
HC mid span gas	: 1200 PPM
HC mid span reading	: 630 PPM
CO mid span gas	: 4.00%
CO mid span reading	: 4.00%
CO2 mid span gas	: 12.0%
CO2 mid span reading	: 12.0%
End Time	: 01:49 PM PST
Low Range Cal Result	: PASS
mid Range CAL Result	: PASS
Before Calibration Readings	
HC zero reading	: 0 PPM
HC span reading	: 111 PPM
CO zero reading	: 0.00%
CO span reading	: 1.00%
CO2 zero reading	: 0.0%
CO2 span reading	: 5.9%
O2 zero reading	: 0.4%
O2 span reading	: 20.1%
HC mid span reading:	: 435 PPM
CO mid span reading	: 3.99%
CO2 mid span reading	: 11.9%
Leak Test Start Time	: 01:49 PM PST
Leak Test Result	: PASS
Overall Cal/Leak Result:	: PASS

US EPA NVFEL EOD TPB VT
 2565 PLYMOUTH RD.
 ANN ARBOR MI 48105

Attachment D

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*****
* VIDEO DRIVER'S AID TEST REPORT (1.21)                      Page 1 of 1 *
* 0192^0000^P1                      Processed: 11:23:29 08/14/92 *
*****
```

-- Test and Vehicle Information --

Test Sch: 0192^0000^P1	Mfr: 000
Shift Sch: A998-0002 (FT4.00)	Veh ID: A000XEX-0000
Drive Sch: LA4(PrepOnly)	Version: 00
Test Type: 23	Eq Test Wgt: 2625
Test Proc: 05	Ind HP: 5.1
Driver ID: 50141	Dyno Site: d003
Key Start: 11:04:53 08/11/92	

-- Test Control Events --

trace	clock	test	event	CVS
time	time	control	time	status
	stamp		seconds	
.0		SETUP		
.0	11:04:10	READY	43.0	RDY
.0	11:04:53	STARTUP	.3	RDY
.0	11:04:54	DRIVE	1369.0	RDY
1369.0	11:27:43	FINISHED	.1	EOT

-- Out of Tolerance Data --

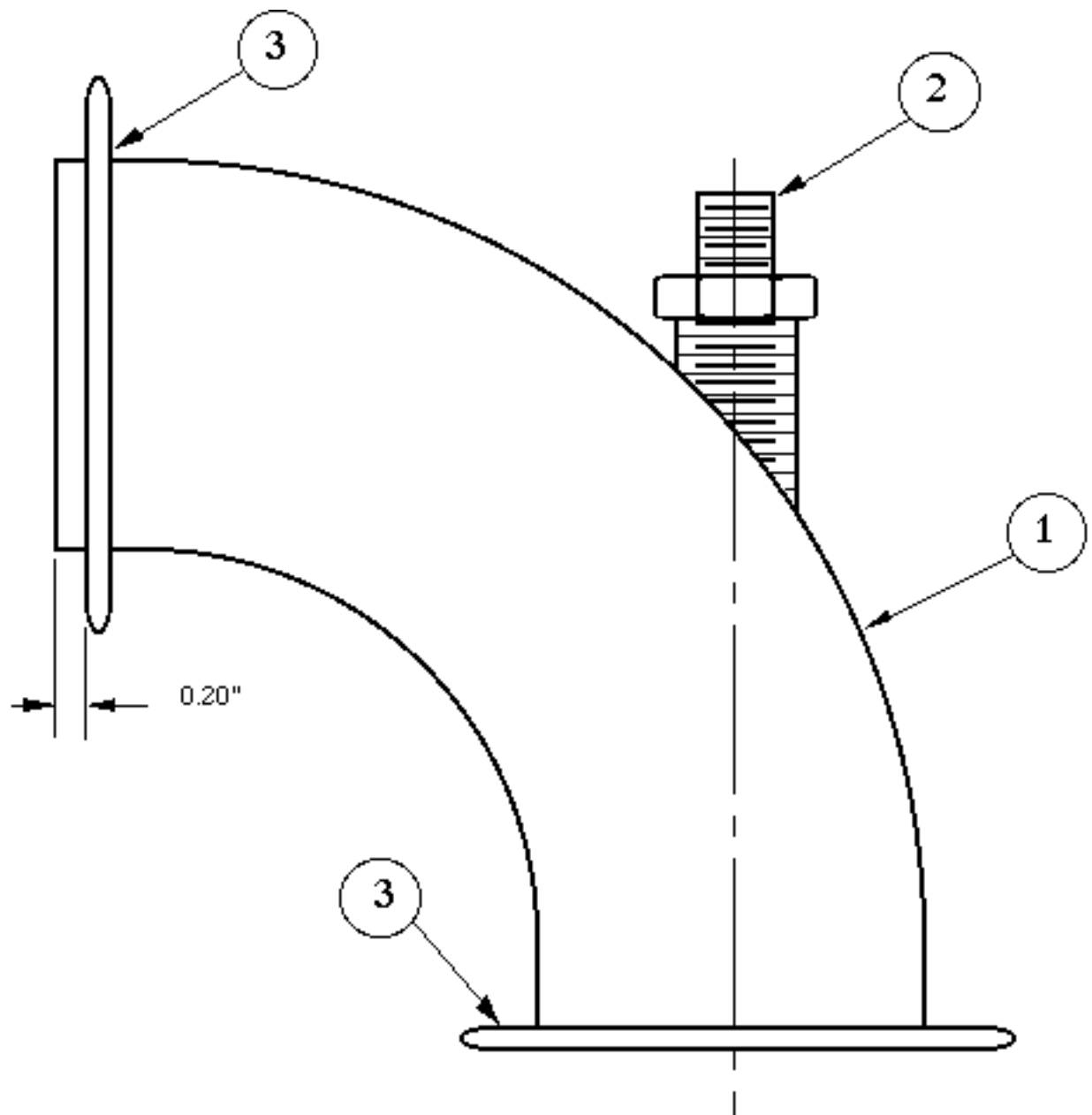
-- Comments --		last	back	max
trace		in tol	in tol	secs
time	comments	@trace	@trace	out
				mph
				out

<no comments or out of tolerance events>

prep tolerance is +/- 4 mph per CFR 86.115-78(b)(1)(v)

TP 715B

Attachment E

**California Inspection and Maintenance Adapter**

1. 2 1/2" stainless steel elbow
2. Adapter, 1/2" NPT male X 3/8 tubing
3. 2 1/2" stainless steel Marmon flange